## REMARKS

This Preliminary Amendment is being submitted concurrently with the filing of a Request for Continued Examination in the above-identified case. The amendments and remarks herein are being submitted in response to the Advisory Action issued November 20, 2003 that was issued by the Examiner to address arguments set forth by applicants in their amendment under 37 C.F.R. §1.116 filed November 4, 2003 in traversal of the Examiner's issued Final Rejection dated August 4, 2003.

Applicants hereby respectfully request the Examiner to reconsider the application in view of the following amendments and remarks.

In the Official Action dated August 4, 2003, which had been made FINAL, the Examiner rejected Claims 1-24 under 35 U.S.C. §103(a) as being unpatentable over Chidlovskii et al. U.S. Patent No. 6,327,590 ("Chidlovskii").

Applicants respectfully disagree in view of the amendments and arguments in traversal herewith. Respectfully, the present invention is generally directed to a classifier device (and method and program instructions executable by machine) for a customer self service system that performs resource search and selection, the system including a context attribute database comprising types of user contexts and one or more context attributes associated with each user context for processing by said system, and context attribute function database comprising functions for computing values for each context attribute, the classifier comprising a mechanism for receiving a user query and a context vector comprising data associating an interaction state with said user and including context that is a function of the user, processing said query and context vector against data included in the context attribute

database and context attribute function database for predicting a particular user context. Further, according to the invention, as now set forth in amended Claims 1, 10 and 19, incorporating subject matter of respective canceled Claims 3, 12 and 21, the context classifier mechanism implements a supervised learning algorithm for predicting user contexts. As a result of this processing, the system predicts a particular user context and populates the user context vector with context parameters specifying for use in a subsequent resource search. Thus, there is provided the ability to relieve the user of the nonproductive work of describing their context and the ability to improve the search value by including criteria derived from both data and behaviors in the general population that may be unknown to the user.

That is, the use of supervised learning applied to a set of historical user interaction records enables the classification of context attributes that are relevant for that particular user of the system. As a result, the user context vector may be populated with context parameters specifying a user interaction state for use in a subsequent resource search. After applying supervised learning, the search results become increasingly relevant and specific for mapping user queries to resources.

Thus, the customer self-service system of the invention uses a highly specialized and optimized combination of supervised and unsupervised logic along with both automated and semi-automated entry of learned results and is able to deliver higher value because contexts are used in a closed loop self improvement system; front end (entry) middle (search and display) and back end (results and user feedback) are integrated. Full support for the added limitations to Claims 1, 10 and 19 may be found in the specification at page 12, lines 7 –22 and in view of Figure 6 where it is described how the Context Classifier

mechanism (29a) applies an inductive learning algorithm to attempt to predict derived contexts. Particularly, for a particular domain, the Context Classifier (29a) analyzes historical user interaction records (19) from the User Interaction Records database (15) to learn how the user, the attributes and the specific values map to Context Attribute functions (16). That is, the user interaction records (15) serve as a training set for the continuous improvement of the functions. This system learning may be accomplished because the user interaction records contain traces of previous interactions, including user-validated contexts that were applicable during those sessions, and the users' response/behaviors around those transactions. Additionally, the Context Classifier (29a) considers both individual user history and that of other users with shared organization, community or environmental similarities leading to common behaviors and acceptance criteria. The output (247) of this process comprise the additions and modifications to the set of Context Attribute functions (16) resulting in increasing ability to predict derived contexts as functions of the raw contexts.

Clearly, the Chidlovskii reference does not have such capability. In Chidlovskii, there appears to have been suggested a limited notion of user context (user picks from user, community or domain expert context) and Chidlovskii appears to have an analog to the claimed user interaction database for saving the identity of the user. However, Chidlovskii is trying to solve the problem of different search engines or meta-search engines returning search results that lack any reference to user context. The Chidlovskii system may also automatically determine the user context by matching a query with a query memory associated with a community or the collection of users using the system. Chidlovskii's context appears to be simply a user profile comprising a document collection with rating information attached to

each document. An important difference however, is that the Chidlovskii system is still text based, using the user's selection of context to modify the term-weight vectors which calculate weights for words used to select relevant documents (Note: Chidlovskii's Title of the Invention: "...Employing user and group profiles derived from document collection content analysis"). Thus, Chidlovskii's system has to analyze the entire text in a document.

With respect to specific rejected elements of Claims 1 and 10 and 19, it is respectfully submitted that the present invention, as now amended, is now patentably distinct from Chidlovskii.

Furthermore, it is submitted that Chidlovskii's system is significantly different than the present invention and, even extending Chidlovskii's limited single dimensional notion of user context (user, community, or domain expert), which focuses only on content, and including the cited Wong's (U.S. Patent No. 6,578,037) notion of a single dimensional context attribute, it still would not have been obvious. While Chidlovskii's system does implement an approach akin to relevance feedback, where ranked search results can be used to update the user profile based on new submission or documents produced in the search and ranked using the user's context, it is submitted that Chidlovskii does not have a context attribute functions database in the sense of the present invention, and, that his vector is not a context vector in the sense of the present invention, and further, does not perform supervised learning (with an identified evaluation metric including positive and negative examples) to drive the selection of relevant resources, but rather relies on other mathematical mechanisms.

Furthermore, while some notions of Chidlovskii's user context are similar context as used in the present invention, Chidlovskii's notion of context is tied to the query

itself. Chidlovskii discusses context and says: "User and community profiles are build using by analyzing document collections put together by the users and the communities to which they belong" (Chidlovskii at col 3, line 16). Some notions of context in the present invention fit this type, e.g., the context of all students taking a single course. However, other contexts considered in the present invention could not be cast in this form. The context of having a low bandwidth connection is just one such example. In the present invention, a context is either true or false for a particular query for a particular individual. That context may depend on the words used in the past by an individual or group, but in many cases it will depend on other factors.

A further difference relates to this last point. Because the notion of context in the present invention is not dependant on the words used by this individual or group, the present invention does not use a "weighting of terms", as described in col. 3, lines 22 et seq. of Chidlovskii. In the present invention, supervised learning is performed (Claims 2, 3, 5, 12, 14, 21 and 23) over the all available features in order to produce a predicative model of context that matches the user-specified data on context. In the present invention, an explicit mechanism is provided to enable the user to observe and correct the context mapping functions. These corrections to the predicted context, allows the system of the present invention to perform supervised induction of context. Thus, in the system of the invention, "expertise" is defined, for example, as a context term, and then declared as having three levels: novice, medium, and expert. Finally, each user is enabled to correct the definition if their expertise context was incorrectly set. This serves as training data in the present invention.

Chidlovskii's system is providing an adaptive model of context, but cannot apply a supervised technique since there is no language for describing the possible contexts outputs. The Chidlovskii system cannot express the negative examples when a user/query does not satisfy a particular context, or even what the possible values for a particular context function is.

With further respect as to why Chidlovskii is not implementing a supervised learning algorithm for predicting user contexts, in Chidlovskii, there is no set of labeled training data. The cited passage at col. 5, lines 58-61 describes use of a set of documents for training. There is no vocabulary of possible context labeling (e.g. UserExpertise = novice, medium, expert ) and the training user/queries in Chidlovskii are not labeled with these terms. People are grouped into communities and communities are assumed to be like aggregate 'people' and a model of this aggregate person is obtained from the documents from the group. In the system of the present invention, if a given user is part of ten contexts, and the GUI is used to switch one of those ten context terms to a new value, a training example is generated for that specific context term. Chidlovskii has no analogous training data for each of their community context models. If a user selects a document, they have no way to understand how that relates to the contexts they have listed for that person. Chidlovskii's model of the context is also more restricted; it is a term-weight vector over terms in the documents selected. That is all they can use, since a set of documents is all they use in training (see col. 6, line 6. of Chidlovskii). Rather, the present invention employs a heterogeneous source of information in training context terms and most of that information is not document terms.

With respect to the Examiner's rejection of Claims 3,12 and 21 the Examiner cites Chidlovskii at col. 3, lines 7-23 as providing this teaching. Respectfully, applicants' submit that Chidlovskii does not teach updating the attribute value functions database with more enhanced functions. As described above, (1) the context functions they learn are weight terms in documents while in the present invention, they are more general; and (2) the inputs they consider are simply sets of documents, while the present invention makes use of other user data.

While it appears that the context store used in Wong (cited in the present Office Action as teaching the manipulation of context attributes) is completely general, and thus could hold any context feature, the user transaction database of the present invention include records that show the user interactions where context terms were explicitly set by the user. These records enable the system of the present invention to build a model of context that could then be placed into the set of context functions. As far applicants can determine, Wong is not using any form of learning to obtain these context expressions, so they have no need for such transaction records. Their policies are simply stored by the user. Indeed Wong at col. 6, line 61 references securely computing relevant policies by the DBMS. Thus, even merging Wong with Chidlovskii would result in a system that goes beyond the vector of terms described in Chidlovskii, but would still have the general problem described herein regarding user interaction that enables supervised induction. Specifically, the user interface of the invention provides users with directly labeled training data for the context classifiers. The merged system of Wong and Chidlovskii still does not teach nor suggest a mechanism for the user to correct or set specific context terms, thus direct supervised induction is impossible.

Furthermore, Chidlovskii's term-weight vector (to provide relevance feedback in the case where the actual document found in response to a search was not ranked by the user) is not the same as and different from the context vector of the presenting invention. As described hereinabove, they are a special case that uses (1) a term weight vector, and (2) sets of documents as input; and, (3) they also do not have directly labeled training data. While they know that a user is part of some set of communities, they do not know how any particular document they select relates to all of those communities, thus they cannot directly train those communities. The method of user interaction in the present invention allows for supervised induction of each context term.

Further with respect to the Examiner's rejection of the present invention (Claims 2, 11 and 20) (citations in Chidlovskii at col. 8 lines 35-55, FIG. 2, col. 2 lines 34-67, and col. 4 lines 16-67), as mentioned above, Chidlovskii does not have directly labeled training data. While their input does provide some basis for adapting communities, for example, it is strictly weaker than the mechanism used in the invention as claimed and described hereinabove.

Further with respect to the Examiner's assertion that Chidlovskii at col. 6 lines 5-59 teaches the term weight vector of user context profile, applicants submit that Chidlovskii does not teach the processing and populating user context vector. Indeed, Chidlovskii at col. 6 line 36-37 is the clearest documentation of a communities documents as being the documents selected by the individual users. However, as mentioned hereinabove, this provides a much weaker characterization of the community. In the present invention, direct evidence is available from manipulation of the user interface about each context.

Applicants further state, in summary, that the present invention has the ability to enable and then capture overrides to context before a search is conducted. The granularity of Chidlovskii, by contrast, is limited to user, community or domain expert and there appears to be no mechanism, other than ignoring the dynamic profile in cases of context shifts, for fine-tuning the context selection, as in the present invention. The current invention emphasizes criteria other than content and reiterate that, to the extent that the user's intent is all about content, the prior art is similar to the present invention. However, because the system of the present invention provides a rich user context vector at query entry time, and because the system of the present invention captures that rich user context data in interaction records, the present invention can identify resources that are more or less useful to the user based upon criteria beyond content, (such as cost, length of time, currency, popularity of resource to others, ability to access the resource from many user environments, etc). This difference is especially important, and novel, and provides value, where resources are not a homogenous set of documents, but a mixed set of differing products or differing formats. The present invention further focuses on contexts that are a function of the user, properties know about the user (like whether they are a manager, they are technical, and which user interface context buttons they have pressed like "I am in class Java programming"). The present invention also considers contexts like the bandwidth of the connection to the user. Contrary to Chidlovskii, none of these contexts of the present invention are a function of the query. Furthermore, contrary to the teachings Chidlovskii/Wong, the "context vector" of the present invention is populated with data which is not necessarily essential to the search itself, but will be useful in: a) setting up the criteria for the results screen and, b) performing adaptive

indexing essential to the adaptive learning characteristics of the system...The functionality of the present system is significant, additive, and unique. They are part of the closed-loop logic of a self-improving system which, it is respectfully submitted, is "novel" and nonobvious."

Furthermore, the system in the present invention differs in the respect of the different aspects of user context used. Unlike the present invention, Chidlovskii's system can not fine tune (granularity capability in user context) the search results in a case, for example, where the user is a manager or has limited connectivity bandwidth, aspects of user context beyond content which do not appear to be addressed by Chidlovskii's notion of user context and cannot be deduced from the selection of documents as described in Chidlovskii. Further, Chidlovskii appears to have no notion of value resource parameters, i.e., parameters beyond content, relating to cost, time, etc. that may be used as a filter to increase the relevance of the response set. Respectfully, these differences have been set forth in new added Claims 25-30. For instance, new Claims 25, 27 and 29 dependent upon respective Claims 1, 10 and 19 set forth that the processing mechanism that receives a user query and a context vector comprising data associating an interaction state with the user and including context that is a function of the user, further includes user context including criteria beyond content. These new claims set forth the ability of the system to identify resources that are more or less useful to the user based upon criteria "beyond content" (such as cost, length of time, currency, ability to access the resource from many user environments, etc.). Further, new Claims 26, 28 and 30 dependent upon respective Claims 1, 10 and 19 set forth that the classifier populates the user context vector with context parameters beyond content, for use in a subsequent resource search. Respectfully, no new matter is being submitted by entry of these claims as full support is found in the specification on page 24, lines 7-15 in the description of Figure 5 where it is

stated that the Resource Selection Criteria Workspace (238) includes a list of criteria (245) which may be used in evaluating resources. This list, provided by the system, is customized by domain; but in all domains, it involves criteria including, but not limited to issues such as: cost, time, timing, quality and risk associated with using a particular resource to satisfy the user's specific need. The initial system default might be to use all criteria and weight them equally. Over time, however, the default criteria may be set by the system based upon user context, user prior transaction history and user behavior on prior searches.

Thus, applicants respectfully request consideration and entry of new Claims 25-30.

In view of the foregoing remarks herein, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance be issued. If the Examiner believes that a telephone conference with the Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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